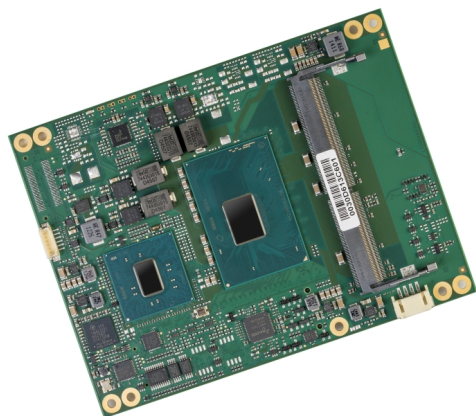




MSC C6B-KLH

Intel® Core™ 7th Generation



 125 x 95

 35 / 55 W

 0 +60



Description

The MSC C6B-KLH module is based on Intel's 7th generation Core processor family. The Intel two-chip solution allows highest performance in graphics and computing on a COM Express module in basic form factor.

The MSC C6B-KLH offers triple independent display support with up to 4k x 2k resolution, highest level graphics acceleration and hardware based video en-/decoding. Fast DDR4 memory with optional error correction (ECC) and multiple USB 3.0/2.0 interfaces complete the compact and powerful module.

Different dual- and quad-core processors are supported by this design. Besides an extensive set of interfaces and features, the MSC C6B-KLH optionally offers hardware based security compliant to the requirements of TCG (Trusted Computing Group).

The Type 6 pin-out allows direct access to the latest digital display interfaces like DisplayPort 1.3, HDMI 1.4b and DVI as well as up to four USB 3.0 interfaces supporting the fastest peripherals currently available.

Highlights

- Intel® Core™ i7-7820EQ (quad-core, 3.0/3.7GHz, 45/35W cTDP),
- Intel® Core™ i5-7440EQ (quad-core, 2.9/3.6GHz, 45/35W cTDP),
- Intel® Core™ i5-7442EQ (quad-core, 2.1/2.9GHz, 25W TDP),
- Intel® Core™ i3-7100E (dual-core, 2.9GHz, 35W TDP),
- Intel® Core™ i3-7102E (dual-core, 2.1GHz, 25W TDP),
- Intel® Xeon® E3-1505Mv6 (quad-core, 3.0/4.0GHz, 45/35W cTDP),
- Intel® Xeon® E3-1505Lv6 (quad-core, 2.2/3.0GHz, 25W TDP)
- Intel® HD Graphics 630, P630
- Intel® chipsets QM175, HM175 or CM238
- Up to 32GB DDR4-2400 SDRAM, dual channel (ECC optional)
- Four SATA 6Gb/s mass storage interfaces
- Three DisplayPort/HDMI/DVI interfaces
- Embedded DisplayPort / LVDS (24 Bit, dual channel) interface
- Triple independent display support
- DirectX 12, OpenGL 4.4, OpenCL 2.x
- Resolution up to 4096 x 2304
- Eight PCI Express™ x1 lanes; PEG x16
- Four USB 3.0/2.0 and four USB 2.0 interfaces
- Trusted Platform Module
- UEFI Firmware

Technical Data - MSC C6B-KLH

| | |
|---------------------------|--|
| Technology | x86 |
| Formfactor | COM Express Basic |
| CPU | <p>Intel® Core™ i7-7820EQ (quad-core, 3.0/3.7GHz, 8MB cache, 45/35W cTDP), Intel® Core™ i5-7440EQ (quad-core, 2.9/3.6GHz, 6MB cache, 45/35W cTDP), Intel® Core™ i5-7442EQ (quad-core, 2.1/2.9GHz, 6MB cache, 25W TDP), Intel® Core™ i3-7100E (dual-core, 2.9GHz, 3MB cache, 35W TDP), Intel® Core™ i3-7102E (dual-core, 2.1GHz, 3MB cache, 25W TDP), Intel® Xeon® E3-1505Mv6 (quad-core, 3.0/4.0GHz, 8MB cache, 45/35W cTDP), Intel® Xeon® E3-1505Lv6 (quad-core, 2.2/3.0GHz, 8MB cache, 25W TDP)</p> <p>Intel® Technologies: Intel® vPro*, Intel® 64, Intel® Virtualization Technology (VT-x)*, Intel® Virtualization Technology for Directed I/O (VT-d)*, Intel® Trusted Execution Technology*, Intel® Adv. Encryption Standard AES-NI*, Intel® Turbo Boost Technology 2.0*</p> <p>* not on all models</p> |
| Chipset | Intel® Platform Controller Hubs (PCH) QM175, HM175 or CM238 |
| RAM | 2x 260-pin SO-DIMM socket for up to 2x 16GB DDR4 SDRAM (DDR4-2400); dual channel operation; ECC option |
| Storage Interfaces | 4x SATA channels (up to 6Gb/s) |
| USB | 4x USB 3.0/2.0, 4x USB 2.0 |
| Serial Interfaces | 2x high-speed serial ports from PCH |
| Bus Interfaces | 8x PCI Express x1 Gen 3, 1x PCI Express Graphics (PEG) x 16 Gen. 3 LPC bus (Low Pin Count bus; no DMA support) |
| Display Controller | <p>Integrated Intel HD graphics Gen. 9 3D Acceleration: DirectX® 11/12, OpenGL 4.3/4.4, OpenGL ES 2.0, OpenCL 2.x; Video Decode: H.264 @ Level 5.2, H.265/HEVC 10-bit, MPEG2, VC1/WMV, JPEG, VP8, VP9 10-bit; Video Encode: H.263, H.264, VP8, AVC JPEG, VP9 GPU-accelerated.</p> <p>Triple independent display support</p> |
| Display Interfaces | <p>Display Port and HDMI/DVI: 3x Digital Display Interface, usable as DisplayPort 1.2 (up to 4096 x 2304 @ 60Hz), also usable as HDMI 1.4b or DVI (up to 4096 x 2160 @ 30Hz) 1x Embedded DisplayPort 1.4 (on variants without LVDS only); 4096 x 2304 @ 60Hz</p> <p>LCD: LVDS 24bit, dual-channel (not on all variants); 1920 x 1200 @ 60Hz</p> |
| Network Interface | 10/100/1000Base-TX (integrated in PCH, Intel® i219LM PHY) |
| Audio Interface | High Definition Audio |
| Security Device | TPM 1.2 |

| | |
|--------------------------|--|
| Miscellaneous | <p>Watchdog Timer: Initiates system reset, programmable</p> <p>Fan Supply: 4-pin header for 12V CPU fan, PWM speed controlled and PWM speed control for system fan supported</p> <p>RTC battery: External</p> <p>System Monitoring: Voltage, temperature, CPU fan, system fan</p> |
| Firmware | <p>UEFI Firmware: AMI Aptio[®] V</p> <p>Security: TPM 1.2 support, TCG compliant</p> <p>Power Management: ACPI Active fan control</p> <p>USB: USB legacy support (keyboard, mouse, storage)</p> <p>Monitoring: System Monitoring Health Monitoring</p> <p>MSC Adv. Boot Device Selection: Boot device priority setting based on physical interfaces</p> |
| OS Support | <p>Windows 10 (embedded) BSP for Linux (Yocto) EAPI (HW Programming Interface)</p> |
| Power Requirement | <p>Voltage: +12V +/-10%, 5V Stby optional,</p> <p>Power Consumption: 35 W to 55 W (typ.)</p> |
| Environment | <p>Ambient Temperature: 0° ... 60°C (operating), -25° ... 85°C (storage)</p> <p>Humidity: 5 ... 95% (operating, non-condensing), 5 ... 95% (storage, non-condensing)</p> |
| Dimensions | 125mm x 95mm x 13mm |
| Certificates | UL / CE |

Order Reference - MSC C6B-KLH

| Order Number | Description | Reference | Cat |
|--------------|---|--|-----|
| 70288 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-7102E, dual-core, 2.1GHz, 25W TDP; Chipset: HM175; Graphics: integrated Intel HD Gen 9 (GT2); LVDS; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7102E-NN0201C PCBFTX | OR |
| 70304 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-7100E, dual-core, 2.9GHz, 35W TDP; Chipset: HM175; Graphics: integrated Intel HD Gen 9 (GT2); LVDS; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7100E-NN0201C PCBFTX | OR |
| 70296 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i5-7442EQ, quad-core, 2.1/2.9GHz, 25W TDP; Chipset: QM175; Graphics: integrated Intel HD Gen 9 (GT2); LVDS; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7442EQ-NN0201C PCBFTX | OR |
| 70298 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i5-7440EQ, quad-core, 2.9/3.6GHz, 45W TDP; Chipset: QM175; Graphics: integrated Intel HD Gen 9 (GT2); LVDS; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7440EQ-NN0201C PCBFTX | OR |
| 70292 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i7-7820EQ, quad-core, 3.0/3.7GHz, 45W TDP; Chipset: QM175; Graphics: integrated Intel HD Gen 9 (GT2); LVDS; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7820EQ-NN0201C PCBFTX | PV |
| 70284 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Xeon E3-1505Lv6, quad-core, 2.2/3.0GHz, 25W TDP; Chipset: CM238; Graphics: integrated Intel HD Gen 9 (GT2); LVDS; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4ECC SO-DIMM. | MSC C6B-KLH-1505LV6-NN1201C PCBFTX | OR |

Order Reference - MSC C6B-KLH

| Order Number | Description | Reference | Cat |
|--------------|---|--|-----|
| 70306 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Xeon E3-1505Mv6, quad-core, 3.0/4.0GHz, 45W TDP, 35W cTDP; Chipset: CM238; Graphics: integrated Intel HD Gen 9 (GT2); LVDS; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4ECC SO-DIMM. | MSC C6B-KLH-1505MV6-NN1201C PCBFTX | PV |
| 70302 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-7102E, dual-core, 2.1GHz, 25W TDP; Chipset: HM175; Graphics: integrated Intel HD Gen 9 (GT1); eDP; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7102E-NN0101C PCBFTX | OR |
| 70286 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-7100E, dual-core, 2.9GHz, 35W TDP; Chipset: HM175; Graphics: integrated Intel HD Gen 9 (GT2); eDP; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7100E-NN0101C PCBFTX | PV |
| 70290 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i5-7442EQ, quad-core, 2.1/2.9GHz, 25W TDP; Chipset: QM175; Graphics: integrated Intel HD Gen 9 (GT2); eDP; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7442EQ-NN0101C PCBFTX | OR |
| 70300 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i5-7440EQ, quad-core, 2.9/3.6GHz, 45W TDP; Chipset: QM175; Graphics: integrated Intel HD Gen 9 (GT2); eDP; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7440EQ-NN0101C PCBFTX | PV |
| 70294 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i7-7820EQ, quad-core, 3.0/3.7GHz, 45W TDP; Chipset: QM175; Graphics: integrated Intel HD Gen 9 (GT2); eDP; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM. | MSC C6B-KLH-7820EQ-NN0101C PCBFTX | PV |

Order Reference - MSC C6B-KLH

| Order Number | Description | Reference | Cat |
|--------------|--|--|-----|
| 70282 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Xeon E3-1505Lv6, quad-core, 2.2/3.0GHz, 25W TDP; Chipset: CM238; Graphics: integrated Intel HD Gen 9 (GT2); eDP; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4ECC SO-DIMM. | MSC C6B-KLH-1505LV6-NN1101C PCBFTX | OR |
| 70308 | COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Xeon E3-1505Mv6, quad-core, 3.0/4.0GHz, 45W TDP, 35W cTDP; Chipset: CM238; Graphics: integrated Intel HD Gen 9 (GT2); eDP; 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4ECC SO-DIMM. | MSC C6B-KLH-1505MV6-NN1101C PCBFTX | OR |

Accessories

| Order Number | Description | Reference |
|------------------------|---|--|
| Carrier Options | | |
| 67295 | COM Express Type 6 Evaluation Carrier Board with PCI Express x4/x16 slot, USB 3.0/2.0, GbE, SATA, DisplayPort, eDP/LVDS, VGA and HD audio interfaces; Mini PCI Express socket, SD card slot, ATX power connector and single 12V power jack. Dimensions: 170mm x 170mm (Mini-ITX form factor) | MSC C6-MB-EV-001 PCBFTX |
| 41857 | COM Express Type 6 Evaluation Carrier Board with various PCI Express x1, x4 and x16 slots, USB 3.0/2.0, GbE, SATA, DisplayPort, HDMI, LVDS, eDP, VGA, HD audio interfaces; mSATA and Mini PCI Express sockets, POST code display, ATX power connector. Dimensions: 305 x 244 mm (ATX form factor) | MSC C6-MB-EVA PCBFTX |
| Cooling Options | | |
| 1131080 | Active Heatsink for C6B-SLH, C6B-KLH, C6B-CFLH and C6B-CFLR consisting of a single-piece aluminum profile with fins, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU and chipset. PWM fan 80x80x15mm. | MSC C6B-SLH-01 HSF-001 |
| 1131081 | Passive Heatsink for C6B-SLH, C6B-KLH, C6B-CFLH and C6B-CFLR consisting of a single-piece aluminum profile with fins, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU and chipset. | MSC C6B-SLH-01 HSI-001 |
| 1131082 | Heatspreader for C6B-SLH, C6B-KLH, C6B-CFLH and C6B-CFLR. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU and chipset. No fan, no SO-DIMM cutout. | MSC C6B-SLH-01 HSP-001 |
| 1131083 | Heatspreader for C6B-SLH, C6B-KLH, C6B-CFLH and C6B-CFLR. Single-piece aluminum profile, standoffs with M2.5 thread, screws and thermopads for the thermal contact to CPU and chipset. No fan, no SO DIMM cutout. | MSC C6B-SLH-02 HSP-001 |
| Memory Options | | |
| 83002 | 4GB DDR4-2400 SoDimm, 1.2V | MOD SODIMM DDR4 4GB PC4-19200 CL17 1B |
| 83003 | 4GB DDR4-2400 SoDimm, 1.2V, ECC | MOD SODIMM DDR4 4GB PC4-19200 CL17 1B |
| 83001 | 8GB DDR4-2400 SoDimm, 1.2V, ECC | MOD SODIMM DDR4 8GB PC4-19200 CL17 1B |
| 81883 | 8GB DDR4-2400 SoDimm, 1.2V | MOD SODIMM DDR4 8GB PC4-19200 CL17 2B |
| Starter Kits | | |

Accessories

| Order Number | Description | Reference |
|--------------|---|-----------------------------------|
| 68752 | Starterkit for COM Express Type 6 modules MSC C6B-SLH with Intel 6th generation Core processors. Consists of Mini-ITX platform board, suitable Heatsink with fan and two DDR4 memory modules. Please order separately the COM Express C6B-SLH module of your choice. | MSC C6-SK-SLH-EV-KIT001 SETPAC |

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